

Technology as Social Practice

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Abstract

This essay questions the commonly-held view that computer technology is a tool that will in and of itself improve education, and ultimately ameliorate social ills. The common view stems from the belief that technology and social practices are separate, a belief articulated here as the Technology Independence Assumption. The invalidity of the assumption is shown through an analysis of the ways that technologies are encoded in social relations and conversely. Thus, the argument is made for a view of technologies and social practices as mutually constituted systems.

Technology as Social Practice

Amidst concerns about corporate downsizing, concentration of wealth, global competition, high taxes, crime, alienated young people, and other societal ills, there is a widely-shared desire for an educational solution. Never mind that these problems vary greatly in terms of their reality and their etiology, and especially in terms of their relation to schooling, many still feel that we would see the problems diminish if only we could fix the schools—establish standards; restructure the funding; or better impart moral values. In this climate, technology appears as an unproblematic and cost-effective solution. It is seen as a single tool, which will simultaneously improve educational practice and prepare students for the twenty-first century. Moreover, in the eyes of many, it is not only relatively inexpensive, it has the additional virtue of avoiding the complexities and the conflicts that come with a more people-based approach to change.

There is thus a broad consensus that schools ought to be more technological, that teachers should be prepared to use the new tools, and that the curriculum ought to change to prepare students for a technological world. In this context, David Blacker's essay, "Political liberalism, technology, and schooling," poses the question: "If technology is tantamount to a comprehensive account of the good life for a human being, ...then must not we as public educators try to adopt

a neutral stance toward it? The question startles, because it undercuts the broad consensus. It asks us to step back to consider what we are doing when we introduce new technologies into schools, and perhaps more significantly, to raise questions about what technologies are, and how they are implicated in social relations. Moreover, it suggests that when we incorporate new tools into social life the complexities and conflicts of social life do not disappear at all.

The Independence Assumption

The essays in this collection address many different aspects relating computer technology and education. But one theme throughout is a questioning of the commonly-held view that computer technology is a tool that will in and of itself improve education, and ultimately ameliorate social ills. That view seems to be built upon the following line of reasoning: Computers are a powerful and benign technology. We can see this in all the ways they have improved medicine, banking, manufacturing, agriculture, communication, and even the arts. The problem we face today is that students do not have access to this technology, and when they do, they do not have the skills to use it effectively. Accordingly, our goal should be to make the technology as widely available as we can in schools, colleges, teacher education, adult literacy programs, and so on. Moreover, we need new curricula to help students learn how to make use of the new tools. Thus, the primary issues are access and training. We need not consider what students think about technology, unless that interferes with their learning. We need not be concerned with epistemological or moral issues, because computer technology is only a tool. In other words, we don't need to ask whether, but only how.

This perspective might be summarized in terms of what I call the Technology Independence Assumption: Technology and social relations are independently constituted and evolve independently of each other. This assumption appears innocuous at first, but as we shall see, it leads to consequences very different from those generated out of alternative assumptions, such as that technology and social relations are constituted through each other. One major corollary of the Technology Independence Assumption is that technologies are tools with fixed meanings whose uses are definable without regard to social relations and values. This principle leads to a notion of a given technology as an *it*, a thing that can be analyzed and understood out of any social context. A second major corollary is that people are agents independent of their technologies. Following this principle, we are led to think that artifacts are devoid of intentionality, and thus that human actions are free with respect to any technologies that people employ.

These principles are plausible, to many people, they appear even obviously true. In fact, they are often articulated as part of the process of helping people come to terms with technologies to address their fears and to begin the process of making appropriate use of new tools. But as the present essays suggest, they obscure, rather than illuminate, any analysis of technologies in education. Instead, I argue here that we need to think of how we encode social relations in technologies, how we conversely encode technologies in social relations, and ultimately, how the two are mutually constituted.

Encoding Social Relations in Technologies

The idea that technologies are tools with fixed meanings whose uses are definable without regard to social relations and values is pervasive in both the literature on technology and

education and in the constructions/construals of technology made by many student and teachers. Adding support to this observation, Ann Larson notes that one fourth of the student teachers in her study left blank a question about the relationship of technology to teaching and learning, this despite their immersion in a program designed to infuse technology throughout the teacher education process. Questions about how to use the tools made sense, but questions about what the tools meant were deemed too complex.

The widespread acceptance of the technological world view discussed by both Blacker and Jeanne Connell, means that this technological view itself becomes invisible. As a result, we do not question why the tool is used, or what is lost through its use, but only how to make greater or more effective use of it. Because we do not question its use, we do not see ways in which the tool already expresses and reifies existing social relations.

For example, as Nicholas Burbules points out in his essay, equity issues in technology have simply not received the attention they deserve. Although recent work (Hawisher & Sullivan, in press; Taylor, Kramarae, & Ebben, 1993) has begun to focus more on issues of equity, power, control, community, censorship, and voice, in many cases these issues are discussed only in passing, if at all. Even when these issues are seriously addressed, they are sometimes seen as outside the realm of the technology per se. The Independence Assumption leads us to conceive new technologies as being value-free. Yet both the accompanying social structures and the very hardware and software embody social relations, in concrete and powerful ways.

For example, Burbules shows how policies of access, legal rulings, commercialization, interface decisions, and other processes operate to define categories of inclusion and exclusion for the Internet. Following a similar line of analysis, Selfe and Selfe (1994) show that even the basic computer interface becomes a site for the maintenance of power relations, favoring professional over working class users, English speakers over non-English, men over women, white over black, and other all-too-familiar hierarchies.

The encoding of social relations in technologies has been well documented in other arenas. This can be seen in the Bijker, Hughes, and Pinch collection (1987), which includes chapters that follow technological changes in areas as diverse as synthetic dye chemistry, medicine, and guided missiles. As an example, the chapter by Pinch and Bijker (1987) chronicles the development of the bicycle, showing how the hardware evolved in response to the social values placed on speed versus safety. The issue of whether women should ride, and how they could do so wearing skirts, was significant in the early development. Its pertinence today can be seen in the various middle bar options, styles, and colors offered in new bicycle models.

Further consideration of how technological artifacts are constructed makes clear that not only are the meanings of these artifacts socially constructed, but their physical designs as well. Thus, technologies are not merely tools with fixed meanings, but are instead imbued with intentionality. We might express this as Haraway (1991) does in her assertion that we are all cyborgs, part and parcel of the technological devices we create.

Encoding Technologies in Social Relations

We encode social relations into our technologies, but we also encode technologies into our social relations (see Commeyras, Orellana, Bruce, & Neilsen, 1996). The second encoding is an additional major limitation of the Independence Assumption, one that is addressed even more thoroughly in the present essays. Burbules shows us how the question cannot be one of using

new technology for old familiar purposes, but of finding that those purposes change, that the way we think and feel about them change, that new purposes and new needs come into being that barely existed before.

Larson asks us to look beyond the effect of technology use and...to examine how such use might mediate students' lives, what meanings students attach to the education experience as a result of technological mediation, and what implications those meanings have for teaching and learning. Her analysis of student teachers' reactions to technology shows that we need to understand much more about how technology becomes a part of students' lives and how they re-construct technology as they establish a system of meanings around it.

Connell examines the question of how computer technology changes the nature of experience and knowledge. Her posing of this question does not tell us to ignore questions regarding access or skill acquisition, but it does ask us to think first in fundamental ways about how technology is a way of being, rather than simply a tool.

Blacker takes that idea one step further as he raises the 'whether' question: Should schools be neutral toward technology? This question leads to numerous others: What is entailed when we adopt the position that technology is a good? How do we ourselves change when we choose to incorporate technology into our lives? Or, even, where have we already made irrevocable choices that have changed our values without our conscious awareness of these changes?

Thus, we again must distance ourselves from the Independence Assumption that technologies and social relations are separately constituted and evolve independently of one another. We can now state that in a positive form, that technologies and social relations are mutually constituted.

The Mutual Constitution of Social Relations and Technologies

The mutual constitution of social relations and technologies occurs because technological artifacts are enmeshed in our activities and our connections to other people. As Latour (1993) argues, objects are actors, participating with texts and humans in actor networks that create meaning. But precisely because we are so enmeshed in these networks, we may find it difficult to see exactly how it operates. Let me give an example:

I needed to use our computer at home one afternoon. It happens to have limited speech input capabilities. Unfortunately for me, my then eight-year-old son Stephen was already using it, but fortunately, I knew that it was time for him to practice piano to get ready for an upcoming lesson. I entered the study and said, 'Stephen, come practice now,' not realizing that he had turned on the speech recognition option. The computer, which didn't know much about piano lessons, heard me saying, not 'Come practice now,' but 'Compress, now' and began compressing all the files on the hard disk. This operation was non-interruptable and we had to shut off the power to stop it. As the saying goes, if the machine does not do what we want, we can always pull the plug. But this event gave me pause. How much is the computer becoming part of our everyday lives, listening to what we say, initiating as well as executing actions? I had loaded the compression software and the speech recognition software, and I spoke the words that started the chain of events, but somewhere along the line, my agency was compromised by my immersion in a symbiotic relationship with the technology. I felt in a personal way both the need and the ultimate inadequacy of Isaac Asimov's laws of robotics. My rogue computer let me know that I was not just a user, but somehow a partner in its actions.

This episode highlights for me just one way in which technologies and social relations intertwine. My relation to Stephen, our conversation, our activities, and our connection to the computer and its actions are all part of a network of practice that cannot be disentangled. In a specific case we might choose to pull the plug, but in a larger sense, we are already implicated in the technologies we think we are viewing from afar. The essays here show this implication from pedagogical, social, epistemological, and moral perspectives. What emerges is that rather than being positioned as free agents about to select a fresh apple, we find ourselves already biting into one with worms in it.

The argument that schooling and technologies should remain separate is comprehensible only if one narrowly equates technology to something like current digital information and communication technologies, and further, ignores the social scripting of that technology (see Akrich, 1992). A more productive view is that education has always been mutually constituted through its technologies.

The invention of writing could be considered to be the first educational technology, one that made possible the systematic transmission of cultural capital from one generation to the next. Or, one could reach further back to the emergence of speech as a technology for teaching and learning. Later, of course, the moveable-type printing press fundamentally altered educational practice through the widespread availability of books. Similarly, one could trace the evolution of education in terms of both the technologies available for use in schooling per se, as well as those dominant in the larger society, such as in the realms of transportation, communication, and manufacturing.

In each of these cases, a given technology brought about educational change, but at the same time, requirements of society operating through the educational system generated changes in the associated technology. For example, the economic imperatives that called for new systems of accounting, legal contracts, map-making, documentation, technical training, and so on, entailed continual changes to the printing technologies. Thus, it is impossible to find a case in which a technocentric, or even a purely sociocentric model of change is fully adequate (Bromley, in press; Bruce, 1993).

Indeed, one might go further to argue that the separation of technologies from social practices is itself problematic (Bromley & Apple, in press). Our question cannot be, "Should we use technologies in the school?" because the school is always imbued throughout with systems of practice built on a variety of technologies, and moreover, an integral part of a larger society that itself is increasingly defined through its technologies. If we want to ask instead, "What kind of place should a school be?" we can begin to make judgments about the role of specific technologies.

Heidegger's (1977) designation of the technological world view can then be seen as encompassing much more than the mere use of a particular tool. On the one hand, the technological view can dominate educational practice without the presence of computers, audiovisual equipment, or other familiar technologies. At the same time, the participation of a particular artifact in the technological view is not a given. A technology is a system of people, texts, artifacts, activities, ideology, and cultural meanings. It doesn't so much determine, as become social practices. Our task then must be to consider critically what those social practices are now and what they can become in the future.

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